PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	'At risk' individuals' responses to direct to consumer advertising of prescription drugs: A nationally representative cross-sectional study
AUTHORS	Khalil Zadeh, Neda; Robertson, Kirsten; Green, James

VERSION 1 – REVIEW

REVIEWER	Marjorie Delbaere, Associate Professor of Marketing Edwards School of Business, Department of Management & Marketing, University of Saskatchewan, Canada
REVIEW RETURNED	13-Jun-2017

GENERAL COMMENTS	This paper is well written and on an interesting topic. The method and analysis were appropriate for the research question. I do, however, have major concerns about the method and analysis that require additional information beyond that included in the manuscript. In addition, I have a few general comments regarding the front-end of the manuscript. General Comments 1. I would like to know why you chose to use the term "medicine advertising". The usual terms in North America are pharmaceutical advertising or (prescription) drug advertising. Is this term more common in New Zealand? 2. Throughout the paper, you refer to the influence that DTCA has on consumers, to "buy the advertised medicine," or to "make decisions in response to medicine advertising." I agree with you that DTCA has an influence on consumers, but you need to acknowledge the role that physicians and pharmacists play in this context. Prescription drugs remain controlled substances that require a prescription. As such, physicians and pharmacists play the role of expert gatekeeper, meaning that any influence DTCA has on consumers is necessarily moderated by these medical professionals. 3. You need to further justify your categorization of older adults and people in poor health as "at risk". On page 4, you suggest that older adults who ask for medication after exposure to medicine advertisements can complicate the patient-physician relationship. Why would this be any different from younger adults who ask for medication? You also suggest that people in poor health may similarly be more susceptible to medicine advertising. Why? What do you mean by "susceptible"? More likely to be misled? 4. You also need to strengthen your case for including materialism in your model. We know that materialism has an impact on consumer behaviour, but what is the link to behavioural

	responses after exposure to drug ads? The connection seems tenuous at best. If you cannot provide further justification for including materialism as a predictor, you should consider dropping it from your model. Specific Comments 5. Are the methods described sufficiently to allow the study to be repeated? • You describe many aspects of the questionnaire in good detail, but you need to provide more information on the dependent variables. You indicate that behavioural responses were after exposure to a medicine advertisement, but you need to specify the exact wording of the questionnaire items, so readers can properly interpret your results. Was the question worded so that it was clear to participants that the behavioural response was with regards to an ad for a specific brand of medication? E.g. “Have you ever asked a doctor for a prescription for a specific brand of medicine that you saw in an advertisements?” Or could it have been after exposure to an ad for any medication? Or even after exposure to a disease awareness ad? This is an extremely important difference as it either indicates a generalized effect of DTCA for prescription drugs, which would lend some support for the camp arguing that DTCA results in medicalization of normal human conditions, or instead indicates the effectiveness of a specific ad or campaign for a specific brand of medication. This knowledge is critical to correctly interpreting the results of your analysis. • You need to indicate clearly in your discussion and conclusion that your measure of health status was a self-report measure of how satisfied participants were with their current health status. When this is not clear, at times you appear to draw conclusions about actual health status, which is very different from reported levels of satisfaction with health status. • The mean and SD for materialism are missing from Table 2 • You should provide more information regarding the dummy variables in your model for ethnicity and working status. What was the reference level for each variable? It appears that New Zealand European is the reference for ethnicity and unemployed is the reference for working status, but this should be clearly stated. 6. Are the outcomes clearly defined? • You should provide information on the classification success of your model as this serves as an important measure of the success of logistic regression. • You provide information for omnibus tests of the models, but you do not indicate Wald statistics for the individual predictor variables. Which predictors were significant for each model? • Your reporting of the regression models is not clear. For each model, you state the independent variables that were “associated” with each dependent variable, which I assumed to mean was a listing of the significant predictor variables in each model. But this does not align with the information reported in Table 3. For example, you list that more positive attitude toward DTCA is associated with asking a physician for a prescription, but Table 3 does not indicate that attitude toward DTCA was a significant predictor for any model. This could be clarified by reporting the Wald statistics for the independent variables in each model, as mentioned above. • Building on this point, rather than report the outcomes of the regression analysis in terms of association of independent variables, you should be reporting the outcomes in terms of prediction of

	behavioural responses. This will allow you to comment on, and qualify, the strength of the predictor variables in terms of the specific behavioural responses. For example, although you list materialism as being associated with asking a pharmacist for more information on an illness, the odds ratio is very close to 1, indicating that this is not a strong predictor. 7. Are the discussion and conclusions justified by the results? • I agree that consumers asking physicians for a prescription of a specific brand of medication is a concerning outcome of DTCA. I am less inclined to agree that asking a physician or pharmacist for more information on an illness, or searching the internet for more information on an illness, after exposure to a drug ad is a troubling outcome. Proponents of DTCA like to point to the educational benefits of drug ads, and your results would seem to support their arguments that these ads serve to inform and educate. The fact that ethnic minorities are more likely to ask a physician or pharmacist for information about an illness than NZ Europeans could in fact be seen as a positive outcome of DTCA. • You need to qualify your conclusions regarding "at risk" individuals. Your results indicate that older adults were more likely to seek information from a doctor or pharmacist, as well as participants with lower levels of satisfaction with their health status (this was a self-report measure in your questionnaire, not an actual measure of health status as implied in your discussion). These same individuals, however, are also more likely to require some form of medical treatment; it, therefore, is not surprising that younger adults and those more satisfied with their health status were less likely to engage in the behavioural responses. • I do not believe that your conclusions regarding materialism are justified by your results. You state that more materialistic individuals were more likely to be influenced by DTCA, and conclude that this suggests DTCA appeals to individuals' desire to consume, rather than provide information. You did not ask participants about perceived informativeness of ads and therefore cannot conclude this. It is quite possible that consumers high in materialism pay more attention to ads, perhaps are exposed to ads more frequently, than consumers low in materialism, and therefore we see a difference in their behaviour.

REVIEWER	Robert McKeever The University of South Carolina, USA
REVIEW RETURNED	11-Jul-2017

GENERAL COMMENTS	General Comments First, let me state that I believe this is an important area of research inquiry and this manuscript presents data from what may constitute

	a conceptually informed and methodologically defensible study. However, one of the key limitations is that it purports to assess "behavioral (sic) responses to direct to consumer advertising of prescription medicines," which is an outcome simply beyond the scope of the measures employed in this cross-sectional study. There are also several secondary concerns that should be addressed, such as the insufficient description of measures utilized in the study, as well as tempering the logical leaps in the discussion and conclusion sections suggesting that negative causal inferences can made about the effects of exposure to DTC ads for prescription medications. To help the authors improve the manuscript for publication I have outlined my primary concerns and provide specific recommendations for addressing these issues below. Intro From the onset, the authors suggest this study tackles the issue of differences in behavioral responses to DTCA for prescription drugs, which is somewhat of a misnomer, as it implies DTCA effects were a key component of this research (e.g., DTCA exposure served as a predictor/separate measured variable from the key outcome variables of interest: talking to a doctor, pharmacist etc.). Although this isn't spelt out clearly in the methods section (a secondary issue), it appears participants were asked whether or not they performed a subset of behaviors in response to DTC ads for prescription drugs, and these dichotomous responses were regressed onto the true focal predictors in the study: attitudes, knowledge, use of the internet, materialism, health status, and demographic measures. For that reason, fundamentally, the thrust of this research is an examination of sociodemographic and latent predictors of participants' perceived effects of DTCA on themselves, which is inherently different than an actual measure of behavioral responses to DTCA. This intrinsically raises concerns involving the study's methods, measures, analysis, and interpretation. Because these concerns are interrelated, rather outlining them by each section in the manuscript, I have organized my feedback based on all of these sections. Methods/Measures/Findings Sample: The authors do a nice job delineating the difference between panel-based and probability-based samples, and the incalculability of response rates in the case of the former. Because the research was conducted by a marketing firm, it is important to explain several additional aspects of the study. For example: Did the authors contract the marketing firm to perform this research or was this secondary analysis of previously collected data? How long was the full instrument, and were all panelists asked these questions or was this subset selected based on response logic to an earlier item in the questionnaire? Another concern with the current draft of the manuscript is that the measures are inadequately described. For example, "Behavioural (sic) responses after exposure to a medicine advertisement were measured through four yes/no statements: asking a physician for a prescription…." Please be explicit in describing both the stem and the response options to questionnaire items. In reading that description it is unclear whether there was a prompt asking participants to indicate whether they had engaged in a behavior after seeing a DTCA, engaged in a behavior knowing of the existence of said DTCA, or something else. In the most literal interpretation, one

	would expect the items stated “When you were exposed to a DTCA did you ask a physician for a prescription?” Also, the seemingly needless median split of the 18-item materialism scale should also be resolved (or justified with sound methodological rationale). Why was this measure dichotomized? In doing so, it would appear the authors sacrifice meaningful variance in reliable (albeit lengthy) scale. Please elaborate on the decision to modify this variable or revisit your analysis. Because the items in the scale are not provided, it would also be useful to delineate where this measure was derived, and why it is appropriate. If it was from a previously validated scale, and therefore presumably unidimensional, an argument can be made for reporting CFA results to demonstrate whether or not the measure operated in accordance with the hypothesized factor structure. These are all details that need to be clarified. As you can see from my feedback, there are a few concerns with the paper in its current form. That said, I think the task of correcting these issues is manageable. Therefore, I encourage you to address them, as they will strengthen the paper and the utility of this study to other scholars.

VERSION 1 – AUTHOR RESPONSE

Responses to Comments from Reviewer 1:

Comment: This paper is well written and on an interesting topic. The method and analysis were appropriate for the research question. I do, however, have major concerns about the method and analysis that require additional information beyond that included in the manuscript. In addition, I have a few general comments regarding the front-end of the manuscript.
Response to comment: Thank you for the encouraging and constructive comments. We sincerely appreciate your time and effort in reviewing our manuscript. Responses to your comments are given below:
General Comments:
Comment 1: I would like to know why you chose to use the term “medicine advertising”. The usual terms in North America are pharmaceutical advertising or (prescription) drug advertising. Is this term more common in New Zealand?

Response to comment 1: In New Zealand, “drugs” most often refers to illicit substances (e.g., cocaine). We also chose to use “medicine advertising” in our first manuscript in order to align with the terminology used by the New Zealand Ministry of Health. However, based on your comment and to ensure that terminology is understood internationally, we have replaced “medicine advertising” with “drug advertising” in our revised manuscript.

Comment 2: Throughout the paper, you refer to the influence that DTCA has on consumers, to “buy the advertised medicine,” or to “make decisions in response to medicine advertising.” I agree with you that DTCA has an influence on consumers, but you need to acknowledge the role that physicians and pharmacists play in this context. Prescription drugs remain controlled substances that require a prescription. As such, physicians and pharmacists play the role of expert gatekeeper, meaning that any influence DTCA has on consumers is necessarily moderated by these medical professionals.

Response to comment 2: We agree that medical professionals play an important role in moderating the effects of DTCA on consumers. We have revised our manuscript to provide a more balanced argument by now discussing the role of experts as gatekeepers in our introduction (page 4, line 8-9) and discussion (page 19, line 20-21).

Comment 3: You need to further justify your categorization of older adults and people in poor health as “at risk”. On page 4, you suggest that older adults who ask for medication after exposure to medicine advertisements can complicate the patient-physician relationship. Why would this be any different from younger adults who ask for medication? You also suggest that people in poor health may similarly be more susceptible to medicine advertising. Why? What do you mean by “susceptible”? More likely to be misled?

Response to comment 3: Older people and those with poorer health are defined as vulnerable populations in medical domain (Aday, 2001; National Center for Health Statistics, 2005; Waisel, 2013). Older people are more likely to need and use multiple prescription drugs, and are more likely to misinterpret information on the effectiveness of advertised drugs (Grenard et al., 2011), so they may also be more vulnerable to drug advertising. In addition, because of their health condition, people with poorer health may need more prescription drugs similar to older individuals and thus may be more motivated by advertised solutions. We thus suggest that people in poor health may be more vulnerable to drug advertising, like older people. We have provided more explanations in the introduction section (page 5, line 8-25; page 6, line 1-4) to clarify and justify our categorization of ‘at risk’ individuals.
In this sentence: “people in poor health may similarly be more susceptible to drug advertising”, by “more susceptible” to drug advertising we meant “more vulnerable” to drug advertising. We have now changed “susceptible” to “vulnerable” throughout the revised manuscript.

Comment 4: You also need to strengthen your case for including materialism in your model. We know that materialism has an impact on consumer behaviour, but what is the link to behavioural responses after exposure to drug ads? The connection seems tenuous at best. If you cannot provide further justification for including materialism as a predictor, you should consider dropping it from your model.

Response to comment 4: We agree that materialism has impacts on consumer behaviour, but the more important point is its impacts on purchasing behaviour. Considering that materialism has been linked with lower well-being, more physical symptoms, more drug use, more attention to advertising, excessive purchasing as well as consumption behaviour (e.g. compulsive consumption) in earlier studies (page 6, line 17-25; page7, line 1), the current research addressed the question of whether materialism has effects on self-reported behavioral responses to DTCA. Based on your helpful recommendation, we have provided more justifications for including materialism as a predictor of self-reported behavioural responses to drug advertising in the introduction section (page 6, line 17-25; page7, line 1-8), and discussion section (page 20, line 5-15).

Specific Comments

Comment 1: You describe many aspects of the questionnaire in good detail, but you need to provide more information on the dependent variables. You indicate that behavioural responses were after exposure to a medicine advertisement, but you need to specify the exact wording of the questionnaire items, so readers can properly interpret your results. Was the question worded so that it was clear to participants that the behavioural response was with regards to an ad for a specific brand of medication? E.g. “Have you ever asked

a doctor for a prescription for a specific brand of medicine that you saw in an advertisements?" Or could it have been after exposure to an ad for any medication? Or even after exposure to a disease awareness ad? This is an extremely important difference as it either indicates a generalized effect of DTCA for prescription drugs, which would lend some support for the camp arguing that DTCA results in medicalization of normal human conditions, or instead indicates the effectiveness of a specific ad or campaign for a specific brand of medication. This knowledge is critical to correctly interpreting the results of your analysis.

Response to comment 1: The behavioural responses were not related to any specific advertisement or for a specific brand of medication. They could have been after exposure to any advertisement for any medication. We have provided the exact wording of the questionnaire items to the methods section (page 8, line 6-13) and related interpretations in the discussion section (page 18, line 11-13).

Comment 2: You need to indicate clearly in your discussion and conclusion that your measure of health status was a self-report measure of how satisfied participants were with their current health status. When this is not clear, at times you appear to draw conclusions about actual health status, which is very different from reported levels of satisfaction with health status.

Response to comment 2: We have used self-reported health status of participants as several studies show that self-reported health status is a good indicator of the burden of disease and a good predictor of subsequent illness, health-care use, premature death, and mortality rates (Banerjee et al., 2010; Idler & Benyamini, 1997; Kuhn et al., 2006; McCallum et al., 1994). Based on your comment, we have clarified that this measure was a self-reported/subjective health status in the methods (page 8, line 18-20) and discussion (page 19, line 1-2) sections, and we have changed health status to self-reported/subjective health status throughout the manuscript.

Comment 3: The mean and SD for materialism are missing from Table 2

Response to comment 3: We have added them to Table 2 (page 12).

Comment 4: You should provide more information regarding the dummy variables in your model for ethnicity and working status. What was the reference level for each variable? It appears that New Zealand European is the reference for ethnicity and unemployed is the reference for working status, but this should be clearly stated.

Response to comment 4: This is now explicit in the methods section (page 9, line 15-17) and results section (Table 3, page 13-14) sections that New Zealand European is the reference for ethnicity and unemployed is the reference for working status.

Comment 5: You should provide information on the classification success of your model as this serves as an important measure of the success of logistic regression.

Response to comment 5: We have added the information on the classification success of each model in the results section (page 16, line 4, 17-18; page 17, line 3-4, 16-17).

Comment 6: You provide information for omnibus tests of the models, but you do not indicate Wald statistics for the individual predictor variables. Which predictors were significant for each model?

Response to comment 6: Statistical significance for individual predictor variables can be determined in two ways from Table 3: If the confidence interval for the odds ratio (OR) does not include 1, or from the asterisks denoting p-values from the Wald statistics, similar to other logistic regression tables in BMJ Open (e.g. Shahabuddin et al., 2017; Sweeting et al., 2012).

According to the journal's guideline, we did not repeat all data presented in Table 3 in the text; and we emphasized only the most important outcomes. However, according to your suggestion, we have added p-values and ORs for significant predictor variables in the revised results section of the revised manuscript (page 15-17) to indicate the predictors that were significant for each model. We have also provided all data (Wald statistics) for all predictor variables of each behavioural outcome below:

Model 1: Asking a doctor for a prescription:
Variables in the Equation
B S.E. Wald df Sig. Exp(B) 95% C.I.for EXP(B)
Lower Upper
Gender -.303 .165 3.373 1 .066 .739 .534 1.021
Age -.001 .007 .039 1 .843 .999 .986 1.012
Maori .283 .234 1.474 1 .225 1.328 .840 2.098
Chinese .803 .345 5.431 1 .020 2.233 1.136 4.387
Indian 1.610 .295 29.881 1 .000 5.004 2.809 8.914
Pacific Island -.140 .415 .114 1 .736 .869 .386 1.959
'Other' Ethnicities .212 .223 .904 1 .342 1.236 .799 1.911
Level of Education -.120 .043 7.846 1 .005 .887 .816 .965
Annual Income -.120 .047 6.423 1 .011 .887 .809 .973
Working Fulltime -.110 .281 .155 1 .694 .895 .516 1.553
Working Part-time -.385 .314 1.509 1 .219 .680 .368 1.258
Self-employed .050 .344 .021 1 .884 1.051 .535 2.065
Retired -.395 .351 1.267 1 .260 .674 .339 1.340
Student -.725 .347 4.357 1 .037 .484 .245 .957
Fulltime Homemaker -.215 .345 .387 1 .534 .807 .410 1.587
Attitude toward DTCA .475 .089 28.344 1 .000 1.608 1.350 1.915
View on Safety of Advertised Medicines -.139 .105 1.767 1 .184 .870 .708 1.068
View on Effectiveness of Advertised Medicines .177 .111 2.569 1 .109 1.194 .961 1.484
Self-reported Health Status -.063 .029 4.625 1 .032 .939 .886 .994
Materialism .032 .009 12.964 1 .000 1.033 1.015 1.051
Searching Online Health Info .279 .088 10.177 1 .001 1.322 1.114 1.569
Attitude toward Advertising .006 .087 .004 1 .948 1.006 .849 1.192
Constant -3.632 .806 20.323 1 .000 .026
Note: Materialism was measured as a total score
Model 2: Asking a doctor for more information about an illness:
Variables in the Equation
B S.E. Wald df Sig. Exp(B) 95% C.I.for EXP(B)
Lower Upper
Gender -.211 .143 2.167 1 .141 .810 .612 1.072
Age .023 .006 15.452 1 .000 1.023 1.012 1.035
Maori .567 .199 8.158 1 .004 1.764 1.195 2.603
Chinese .686 .332 4.284 1 .038 1.986 1.037 3.805
Indian 1.357 .287 22.371 1 .000 3.883 2.213 6.813
Pacific Island .254 .354 .513 1 .474 1.289 .644 2.580
'Other' Ethnicities .303 .187 2.640 1 .104 1.355 .939 1.953
Level of Education -.042 .037 1.255 1 .263 .959 .891 1.032
Annual Income -.121 .041 8.507 1 .004 .886 .817 .961
Working Fulltime -.063 .254 .062 1 .804 .939 .571 1.544
Working Part-time -.250 .275 .823 1 .364 .779 .454 1.336
Self-employed -.659 .337 3.815 1 .051 .517 .267 1.002
Retired -.554 .296 3.498 1 .061 .575 .322 1.027
Student .096 .304 .100 1 .752 1.101 .607 1.996

Fulltime Homemaker -.557 .328 2.888 1 .089 .573 .301 1.089
Attitude toward DTCA .424 .076 30.735 1 .000 1.527 1.315 1.774
View on Safety of Advertised Medicines -.108 .090 1.446 1 .229 .897 .752 1.071
View on Effectiveness of Advertised Medicines .062 .095 .430 1 .512 1.064 .883 1.283
Self-Reported Health Status -.067 .026 6.840 1 .009 .935 .889 .983
Materialism .014 .008 3.256 1 .071 1.014 .999 1.029
Searching Online Health Info .511 .076 45.233 1 .000 1.667 1.437 1.935
Attitude toward Advertising .084 .076 1.202 1 .273 1.087 .936 1.263
Constant -3.916 .701 31.164 1 .000 .020
Note: Materialism was measured as a total score
Model 3: Searching the Internet for more information regarding an illness:
Variables in the Equation
B S.E. Wald df Sig. Exp(B) 95% C.I.for EXP(B)
Lower Upper
Gender .308 .115 7.189 1 .007 1.360 1.086 1.703
Age .008 .005 2.842 1 .092 1.008 .999 1.017
Maori .082 .172 .226 1 .635 1.085 .775 1.519
Chinese .198 .273 .528 1 .467 1.219 .714 2.080
Indian .457 .268 2.895 1 .089 1.579 .933 2.672
Pacific Island .075 .282 .070 1 .791 1.077 .620 1.871
'Other' Ethnicities .249 .146 2.927 1 .087 1.283 .964 1.707
Level of Education -.012 .030 .154 1 .695 .988 .932 1.048
Annual Income -.010 .031 .105 1 .745 .990 .931 1.052
Working Fulltime .379 .224 2.866 1 .090 1.460 .942 2.264
Working part-Time .126 .241 .275 1 .600 1.135 .708 1.820
Self-employed .066 .273 .059 1 .808 1.069 .626 1.825
Retired .094 .262 .129 1 .719 1.099 .657 1.837
Student .420 .257 2.679 1 .102 1.522 .920 2.516
Fulltime Homemaker -.076 .265 .082 1 .775 .927 .552 1.558
Attitude toward DTCA .292 .060 24.021 1 .000 1.339 1.192 1.506
View on Safety of Advertised Medicines -.064 .072 .804 1 .370 .938 .815 1.079
View on Effectiveness of Advertised Medicines .019 .076 .061 1 .805 1.019 .879 1.182
Self-Reported Health Status -.110 .021 26.794 1 .000 .896 .859 .934
Materialism .020 .006 10.587 1 .001 1.020 1.008 1.032
Searching Online Health Info .854 .062 187.824 1 .000 2.348 2.078 2.653
Attitude toward Advertising .085 .061 1.966 1 .161 1.089 .967 1.227
Constant -3.669 .563 42.440 1 .000 .026
Note: Materialism was measured as a total score
Model 4: Asking a pharmacist for more information about the advertised drug:
Variables in the Equation
B S.E. Wald df Sig. Exp(B) 95% C.I.for EXP(B)
Lower Upper
Gender .077 .140 .300 1 .584 1.080 .821 1.419
Age .015 .006 7.182 1 .007 1.015 1.004 1.027
Maori .724 .193 14.119 1 .000 2.063 1.414 3.010
Chinese .934 .306 9.342 1 .002 2.546 1.398 4.635
Indian .570 .310 3.375 1 .066 1.768 .963 3.247
Pacific Island .496 .332 2.238 1 .135 1.643 .857 3.147
'Other' Ethnicities .574 .173 11.047 1 .001 1.776 1.266 2.492
Level of Education .027 .037 .541 1 .462 1.028 .956 1.105
Annual Income -.095 .040 5.626 1 .018 .910 .841 .984
Working Fulltime .164 .258 .402 1 .526 1.178 .710 1.954

Working Part-time -.302 .286 1.115 1 .291 .740 .422 1.295
Self-employed -.009 .317 .001 1 .977 .991 .533 1.844
Retired -.260 .303 .738 1 .390 .771 .426 1.395
Student -.259 .317 .666 1 .414 .772 .414 1.438
Fulltime Homemaker -.054 .309 .030 1 .862 .948 .517 1.736
Attitude toward DTCA .332 .074 20.239 1 .000 1.394 1.206 1.611
View on Safety of Advertised Medicines .018 .088 .044 1 .834 1.019 .858 1.210
View on Effectiveness of Advertised Medicines .038 .092 .172 1 .679 1.039 .867 1.245
Self-Reported Health Status -.061 .025 5.848 1 .016 .941 .896 .989
Materialism .005 .007 .447 1 .504 1.005 .990 1.020
Searching Online Health Info .279 .075 14.033 1 .000 1.322 1.142 1.530
Attitude toward Advertising .139 .075 3.434 1 .064 1.149 .992 1.330
Constant -4.236 .691 37.596 1 .000 .014
Note: Materialism was measured as a total score

Related references:
Shahabuddin AS, De Brouwere V, Adhikari R, et al. Determinants of institutional delivery among young married women in Nepal: Evidence from the Nepal Demographic and Health Survey, 2011. BMJ open. 2017;7(4):e012446.
Sweeting HN, Bhaskar A, Hunt K. Positive associations between consumerism and tobacco and alcohol use in early adolescence: cross-sectional study. BMJ open. 2012;2(5):e001446.

Comment 7: Your reporting of the regression models is not clear. For each model, you state the independent variables that were “associated” with each dependent variable, which I assumed to mean was a listing of the significant predictor variables in each model. But this does not align with the information reported in Table 3. For example, you list that more positive attitude toward DTCA is associated with asking a physician for a prescription, but Table 3 does not indicate that attitude toward DTCA was a significant predictor for any model. This could be clarified by reporting the Wald statistics for the independent variables in each model, as mentioned above.

Response to comment 7: We have changed the wording from “associated with” to “predicted by” in the results section (page 15-17).
Regarding your specific example, we agree that we did not make clear the distinction between attitude toward advertising in general, and attitude specifically toward DTCA in Table 3. This is now explicit in Table 3 (page 15) as well as the text (page 8, line 16-17). Hopefully, it is now clear that attitude toward DTCA was a significant predictor for all four models (but the attitude towards advertising in general was not). We have also included p-values and ORs for the significant predictors of each model in the results section (page 15-17) to clarify this issue.

Comment 8: Building on this point, rather than report the outcomes of the regression analysis in terms of association of independent variables, you should be reporting the outcomes in terms of prediction of behavioural responses. This will allow you to comment on, and qualify, the strength of the predictor variables in terms of the specific behavioural responses. For example, although you list materialism as being associated with asking a pharmacist for more information on an illness, the odds ratio is very close to 1, indicating that this is not a strong predictor.

Response to comment 8: Based on your recommendation, we have changed the reporting of findings from “associated with” to “predicted by” in the results section (page 15-17) to show the predictor variables in each model. We have also added p-values and ORs for the significant predictors in each model in the results section (page 15-17).
Regarding materialism, we agree with your comment and we did not claim in the first manuscript that materialism was a predictor of asking a pharmacist for more information about the advertised medicine (the 95% CI for the OR (1.17 (0.90-1.53)) includes 1.00, and it is not flagged as being a significant result).
We note that having changed to treating materialism as a continuous score, this scale modification has now changed the magnitude of the odd ratios so that the odd ratio now reflects the increase for each 1 point increase in materialism.

Comment 9a: I agree that consumers asking physicians for a prescription of a specific brand of medication is a concerning outcome of DTCA. I am less inclined to agree that asking a physician or pharmacist for more information on an illness, or searching the internet for more information on an illness, after exposure to a drug ad is a troubling outcome. Proponents of DTCA like to point to the educational benefits of drug ads, and your results would seem to support their arguments that these ads serve to inform and educate.

Response to comment 9a: We have now included a broader discussion surrounding information searching. We agree that “asking a doctor for a prescription” would be the most problematic behavioural response and searching for more information may educate consumers/patients and can increase their awareness. However, we also think that individuals may be misled by the probable exaggerated claims of DTCA, which may result in the spread of irrational information and misuse or irrational use of drugs (Baukus, 2004; Chan et al., 2013). For instance, DTCA can lead individuals to search or ask about a drug or for an illness that they do not have it. It may cause individuals to think they just need drugs to feel well. It may result in an unnecessary physician visit, which can be a waste of time and money. Our findings thus align with the arguments of advocates of DTCA, who state that DTCA increases individuals’ knowledge and awareness; however, they also align with the arguments of those who oppose DTCA. Therefore, we have provided more balanced argument in the introduction section (page 3, line 5-23) and discussion section (page 18, line 11-22) to cover both positive and negative effects of seeking medications or further information.

Related references:
Baukus R. DTC advertising. J Health Commun 2004;9(6):563-578.
Chan K, Tsang L, Leung V. Consumers’ attitudes toward advertising by medical professionals. J Consum Mark 2013;30(4):328-334.

Comment 9b: The fact that ethnic minorities are more likely to ask a physician or pharmacist for information about an illness than NZ Europeans could in fact be seen as a positive outcome of DTCA.

Response to comment 9b: Ethnic minorities are defined as vulnerable populations in medical domain (Aday, 2001; National Center for Health Statistics, 2005; Waisel, 2013). Research also shows health outcomes for ethnic minorities as poorer compared to the majority population (Ajwani et al., 2003; Bramley et al., 2005; Marriott & Sim, 2015; National Center for Health Statistics, 2005; Waisel, 2013). In this study, the outcomes regarding ethnicity were:
a) Indian and Chinese respondents were more likely to ask physicians for a prescription, relative to New Zealand Europeans.

b) Maori, Chinese, and Indian respondents were more likely to ask their physicians for information about an illness relative to New Zealand Europeans.
c) Maori, Chinese, and 'other' ethnicities were more likely than New Zealand European respondents to ask pharmacists for more information about a drug relative to New Zealand Europeans.

We agree that we can have both positive and negative views on these outcomes. The finding that 'at risk' individuals are more likely to ask a physician or pharmacist for information could be a positive or negative outcome of DTCA. We have thus added necessary details regarding ethnic minorities into introduction section (page 5, line 8-11, 24-25; page 6, line1-4) and we have included more balanced argument into the introduction (page 3, line 5-23) and discussion section (page 18, line 11-22) to address your comment about these outcomes.

Comment 10: You need to qualify your conclusions regarding "at risk" individuals. Your results indicate that older adults were more likely to seek information from a doctor or pharmacist, as well as participants with lower levels of satisfaction with their health status (this was a self-report measure in your questionnaire, not an actual measure of health status as implied in your discussion). These same individuals, however, are also more likely to require some form of medical treatment; it, therefore, is not surprising that younger adults and those more satisfied with their health status were less likely to engage in the behavioural responses.

Response to comment 10: As previously noted in response to Comment 2, we have changed health status to self-reported health status throughout the manuscript, and we emphasized that health status was a self-reported measure of how satisfied participants were with their health in methods section (page 8, line 18-20). We have also added the explanation regarding 'at risk' individuals to the introduction section (page 5, line 8-25; page 6, line 1-4), and we explained in the introduction (page 5, line 17-19, 21-24) and discussion (page 19, line 4-8) sections that older people and those with lower levels of health status are more likely to need medical treatments. Our outcomes showed that 'at risk' individuals were more likely to respond to commercial drug advertising. We thus clarified in the discussion section (page 18, line 11-22) that seeking help from a physician or pharmacist might be either a positive or a negative issue.

Comment 11: I do not believe that your conclusions regarding materialism are justified by your results. You state that more materialistic individuals were more likely to be influenced by DTCA, and conclude that this suggests DTCA appeals to individuals' desire to consume, rather than provide information. You did not ask participants about perceived informativeness of ads and therefore cannot conclude this. It is quite possible that consumers high in materialism pay more attention to ads, perhaps are exposed to ads more frequently, than consumers low in materialism, and therefore we see a difference in their behaviour.

Response to comment 11: We have removed "rather than purely providing information regarding medicines" from our abstract (results section) and "so than acting as a form of health information" from our discussion section. Moreover, we agree that more materialistic consumers might be more exposed to and pay more attention to ads than consumers low in materialism (Graham, 1999) and we have included this explanation to our introduction (page 6, line 24-25), discussion (page 20, line 10) and conclusions (page 22, line 9) sections.
However, our inferences were not about the amount of their exposure to DTCA and the subsequent consequences. We have not explored the motivations of more materialistic individuals. Since the

question was about individuals' self-reported behavioural responses as a result of seeing an advertisement for a drug, regardless of the motivations, our findings showed that more materialistic people were more likely to report responses to drug advertising, which can be either as a result of paying more attention to ads, being persuaded by the unabashed attempt of the advertisements to cause people to purchase something, or treating medicines as other consumer goods even though some useful information may be provided in the process. We have thus elaborated on this issue in discussion (page 20, line 5-15), and conclusion (page 22, line 6-11). We have also included this limitation on page 21 (line 3-5), and noted that future studies could explore individuals' motivations and perceived informativeness of ads.

Responses to Comments from Reviewer 2:
We sincerely appreciate your time and effort in reviewing our manuscript. Your comments are very constructive, and we have revised the manuscript accordingly. Responses to your comments are given below:

General Comments:

Comment 1: First, let me state that I believe this is an important area of research inquiry and this manuscript presents data from what may constitute a conceptually informed and methodologically defensible study. However, one of the key limitations is that it purports to assess "behavioral (sic) responses to direct to consumer advertising of prescription medicines," which is an outcome simply beyond the scope of the measures employed in this cross-sectional study.

Response to comment 1: Thank you for the encouraging opinion and valuable suggestion. We have changed behavioural responses to self-reported behavioural responses in this manuscript. We have also explained in the limitation section (page 20, line 24; page 21, line 1-3) and our article summary that using self-reported behavioural responses limits causal conclusions of this study.

Comment 2: There are also several secondary concerns that should be addressed, such as the insufficient description of measures utilized in the study, as well as tempering the logical leaps in the discussion and conclusion sections suggesting that negative causal inferences can made about the effects of exposure to DTC ads for prescription medications. To help the authors improve the manuscript for publication I have outlined my primary concerns and provide specific recommendations for addressing these issues below.

Response to comment 2: Based on your suggestions, we have provided more descriptions of measures utilized in the study in methods section (page 8-9). We have also made the required changes in methods, discussion and conclusions sections based on your comments below. Moreover, we have clarified in our limitation section (page 20, line 24; page 21, line 1-3) that using self-reported behavioural responses limits causal conclusions of this study and experimental studies should be conducted to extend the outcomes and contributions of this study.

Specific Comments

Comment 1: Intro
From the onset, the authors suggest this study tackles the issue of differences in behavioral responses to DTCA for prescription drugs, which is somewhat of a misnomer, as it implies DTCA effects were a key component of this research (e.g., DTCA exposure served as a predictor/separate measured variable from the key outcome variables of interest: talking to a doctor, pharmacist etc.).

Although this isn't spelt out clearly in the methods section (a secondary issue), it appears participants were asked whether or not they performed a subset of behaviors in response to DTC ads for prescription drugs, and these dichotomous responses were regressed onto the true focal predictors in the study: attitudes, knowledge, use of the internet, materialism, health status, and demographic measures. For that reason, fundamentally, the thrust of this research is an examination of sociodemographic and latent predictors of participants' perceived effects of DTCA on themselves, which is inherently different than an actual measure of behavioral responses to DTCA. This intrinsically raises concerns involving the study's methods, measures, analysis, and interpretation. Because these concerns are interrelated, rather outlining them by each section in the manuscript, I have organized my feedback based on all of these sections.

Response to comment 1: In the current study, exposure to medicine advertisement was not an independently measured predictor. The self-reported behavioural outcomes examined in this study were:
1. As a result of seeing an advertisement for a drug, have you asked your doctor for a prescription?
2. As a result of seeing an advertisement for a drug, have you asked your doctor for more information about an illness?
3. As a result of seeing an advertisement for a drug, have you searched the internet for more information regarding an illness?
4. As a result of seeing an advertisement for a drug, have you asked your pharmacist for more information about a drug?

We have now stated in the methods section (page 8, line 6-7) that the behavioural responses to DTCA were participants' perceived effects of DTCA on themselves. Further, as noted above, we have changed 'behavioural responses' to 'self-reported/perceived behavioural responses' in all parts of this manuscript. We have also revised the interpretation of our results based on your comment (page 18-20). Moreover, we have mentioned this issue in our article summary and limitation section and have suggested that future research could address this area (page 20, line 24; page 21, line 1-3).

Comment 2: Methods/Measures/Findings
Sample: The authors do a nice job delineating the difference between panel-based and probability-based samples, and the incalculability of response rates in the case of the former. Because the research was conducted by a marketing firm, it is important to explain several additional aspects of the study. For example: Did the authors contract the marketing firm to perform this research or was this secondary analysis of previously collected data?
How long was the full instrument, and were all panelists asked these questions or was this subset selected based on response logic to an earlier item in the questionnaire?

Response to comment 2: We contacted and contracted Research Now Company. We have added all suggested details to the methods section (page 7, line 17-18, 21-22, 24; page 8, line 1-2).

Comment 3: Another concern with the current draft of the manuscript is that the measures are inadequately described. For example, "Behavioural (sic) responses after exposure to a medicine advertisement were measured through four yes/no statements: asking a physician for a prescription…." Please be explicit in describing both the stem and the response options to questionnaire items. In reading that description it is unclear whether there was a prompt asking participants to indicate whether they had engaged in a behavior after seeing a DTCA, engaged in a behavior knowing of the existence of said DTCA, or something else. In the most literal interpretation,

one would expect the items stated “When you were exposed to a DTCA did you ask a physician for a prescription?”

Response to comment 3: Following your instructions, we have provided more clarifications regarding the dependent variables/self-report behavioural responses in methods section (page 8, line 6-13).

Comment 4: Also, the seemingly needless median split of the 18-item materialism scale should also be resolved (or justified with sound methodological rationale). Why was this measure dichotomized? In doing so, it would appear the authors sacrifice meaningful variance in reliable (albeit lengthy) scale. Please elaborate on the decision to modify this variable or revisit your analysis. Because the items in the scale are not provided, it would also be useful to delineate where this measure was derived, and why it is appropriate. If it was from a previously validated scale, and therefore presumably unidimensional, an argument can be made for reporting CFA results to demonstrate whether or not the measure operated in accordance with the hypothesized factor structure. These are all details that need to be clarified.

Response to comment 4: Richins and Dawson’s scale has been widely used in consumer research (Burroughs & Rindfleisch, 2002; Fitzmaurice & Comegys, 2006; Kamal et al., 2013; Otero-López et al., 2011; Roberts et al., 2005); and it has shown robust psychometric properties in international research (Burroughs & Rindfleisch, 2002; Eastman et al. 1997).

We dichotomized this measure since it has been widely treated that way in the literature (Berge et al., 2016; Dong et al., 2013; Fitzmaurice & Comegys, 2006; Iacobucci et al., 2015a,b; Körner et al., 2004; Ku et al., 2016; Rindfleisch et al., 2008; Treutlein et al., 2006). However, according to your comment, we have switched to treating it as a continuous measure for analysis. We note that this weakens the association between materialism and asking a doctor for more information, but that the results are otherwise similar.
Our CFA did not find the original subscale structure, a not uncommon finding (Lipovčan et al., 2015; Richins, 2004). Moreover, previous research has revealed that items can be summed to reflect an overall materialism score. Thus, in line with common practice, we have computed a total materialism score, a widely used scale (e.g., Bearden et al., 2011; Giacomantonio et al., 2013; Opree; 2014; Slater & Tiggemann, 2016; Watson, 2003). We have elaborated on the use of Richins and Dawson’s (1992) materialism scale and total materialism score and provided more clarifications in methods section (pages 8, line 21-23; page 9, line 1-10), including the reference for the materialism scale (Richins & Dawson, 1992), so that a reader could find the items in that paper.

Related references:
Berge J, Sundell K, Öjehagen A, et al. Role of parenting styles in adolescent substance use: results from a Swedish longitudinal cohort study. BMJ Open 2016;6(1):e008979.
Dong YH, Slavin MJ, Chan BP-L, et al. Cognitive screening improves the predictive value of stroke severity scores for functional outcome 3–6 months after mild stroke and transient ischaemic attack: an observational study. BMJ Open 2013;3(9):e003105.
Fitzmaurice J, Comegys C. Materialism and social consumption. J Mark Theory Pract 2006; 14(4):287-299.
Iacobucci D, Posavac SS, Kardes FR, et al. Toward a more nuanced understanding of the statistical properties of a median split. J Consum Psychol 2015a;25(4):652-665.
Iacobucci D, Posavac SS, Kardes FR, et al. The median split: Robust, refined, and revived. J Consum Psychol 2015b;25(4):690-704.
Körner Y, Meindorfner C, Möller JC, et al. Predictors of sudden onset of sleep in Parkinson's disease. Movement Disord 2004;19(11):1298-305.
Ku L, Wu A, Lao AK, et al. “We want the world and we want it now”: Materialism, time perspectives and problem spending tendency of Chinese. Int J Psychol 2016:1-9.

Lipovčan LK, Prizmić-Larsen Z, Brkljačić T. Materialism, affective states, and life satisfaction: case of Croatia. SpringerPlus 2015;4(1):699.
Rindfleisch A, Burroughs JE, Wong N. The safety of objects: Materialism, existential insecurity, and brand connection. J Consum Res. 2008;36(1):1-6.
Treutlein J, Kissling C, Frank J, et al. Genetic association of the human corticotropin releasing hormone receptor 1 (CRHR1) with binge drinking and alcohol intake patterns in two independent samples. Mol Psychiatr 2006;11(6):594.

Comment 5: As you can see from my feedback, there are a few concerns with the paper in its current form. That said, I think the task of correcting these issues is manageable. Therefore, I encourage you to address them, as they will strengthen the paper and the utility of this study to other scholars.

Response to comment 5: Thank you for the promising opinion. We believe we have addressed all the suggestions. We feel that the manuscript has been significantly strengthened after addressing your recommendations.

VERSION 2 – REVIEW

REVIEWER	Marjorie Delbaere University of Saskatchewan, Canada
REVIEW RETURNED	15-Aug-2017

GENERAL COMMENTS	I enjoyed reading this revised manuscript and appreciate that the authors have incorporated many of the reviewer suggestions. As such, the authors have addressed most of my concerns. Two points, however, remain outstanding: materialism and the interpretation of odds ratios. If these points are addressed I believe there is a potential for this manuscript to make a contribution to the literature. Materialism The authors have expanded their discussion of materialism, and I appreciate this, but I still believe materialism does not fit well with the other elements of your study. As stated in your manuscript, “A defining characteristic of highly materialistic individuals is a belief that well-being can be enhanced through one’s relationships with objects.” Prescription drugs are not objects, nor can they be directly purchased by consumers, weakening the applicability of materialism to the DTC context. Even if we expand our understanding of objects to include drugs, by including materialism in your study of other characteristics of vulnerable populations, i.e. ethnic minorities, lower income, lower education, poor health status, you are implying that materialistic consumers are similarly vulnerable. I realize that you do not make this explicit claim, but it is implied nonetheless. I agree that it is well established in the literature that materialism is associated with negative states, such as lower subjective well-being, but you dilute the value of your contributions with regards to your findings on the other predictors. In addition, your odds ratios for materialism predicting the outcome variables were not strong (1.03 and 1.02). I would recommend dropping materialism from this manuscript to

	enhance its overall contribution. If the editor disagrees, however, I would expect you to comment on these points and interpret and discuss the meaning of the odds ratio. If materialism is removed from your study, the manuscript would need to be re-positioned somewhat from making a unique contribution re. materialism. The findings lend support to other research that studied ethnic minorities and their responses to DTC in the U.S. (c.f. Lee, Doohee and Charles E. Begley, "Racial and ethnic disparities in response to direct-to-consumer advertising," American Journal of Health-System Pharmacy July 2010, 67 (14) 1185-1190; DOI: https://doi.org/10.2146/ajhp090600; Byoungkwan, L., Salmon, C. T., & Hye-Jin, P. (2007). THE EFFECTS OF INFORMATION SOURCES ON CONSUMER REACTIONS TO DIRECT-TO-CONSUMER (DTC) PRESCRIPTION DRUG ADVERTISING. Journal Of Advertising, 36(1), 107-119.) and extend the generalization of the disparate effects of DTC advertising on vulnerable populations to countries outside of North America. Interpreting Odds Ratios The reporting of your findings has been improved in the revised manuscript; however, you still did not include an interpretation of the odds ratios for the different significant predictors. Given the fact that you have a mix of continuous and categorical predictors, this is important to include as it will help readers assess the strength and significance of your findings. For example, the odds of Indian ethnic consumers asking a doctor for a prescription after having seen a drug ad were 5 times greater than NZ Europeans, while the odds of Chinese ethnic consumers asking were 2.33 times greater. The increased odds over NZ Europeans is substantial and interesting and should be touched on in your discussion. This doesn't have to be a lengthy addition, but you should at least briefly discuss the magnitude of the findings. On the other hand, the odds ratio for age as a predictor of asking a pharmacist for more information was 1.01. For every 1-year increase in age, the odds of a consumer asking a pharmacist for more information on a drug after seeing a drug ad increases by 1.01 times.

REVIEWER	Robert McKeever University of South Carolina
REVIEW RETURNED	29-Aug-2017

GENERAL COMMENTS	All of my concerns have been addressed with this revision

VERSION 2 – AUTHOR RESPONSE

Responses to Comments from Reviewer 1:

Comment: I enjoyed reading this revised manuscript and appreciate that the authors have incorporated many of the reviewer suggestions. As such, the authors have addressed most of my concerns. Two points, however, remain outstanding: materialism and the interpretation of odds ratios. If these points are addressed I believe there is a potential for this manuscript to make a contribution to the literature.

Response to comment: We appreciate the encouraging opinion. Responses to the comments are given below:

Materialism

The authors have expanded their discussion of materialism, and I appreciate this, but I still believe materialism does not fit well with the other elements of your study. As stated in your manuscript, “A defining characteristic of highly materialistic individuals is a belief that well-being can be enhanced through one’s relationships with objects.” Prescription drugs are not objects, nor can they be directly purchased by consumers, weakening the applicability of materialism to the DTC context. Even if we expand our understanding of objects to include drugs, by including materialism in your study of other characteristics of vulnerable populations, i.e. ethnic minorities, lower income, lower education, poor health status, you are implying that materialistic consumers are similarly vulnerable. I realize that you do not make this explicit claim, but it is implied nonetheless. I agree that it is well established in the literature that materialism is associated with negative states, such as lower subjective well-being, but you dilute the value of your contributions with regards to your findings on the other predictors. In addition, your odds ratios for materialism predicting the outcome variables were not strong (1.03 and 1.02). I would recommend dropping materialism from this manuscript to enhance its overall contribution. If the editor disagrees, however, I would expect you to comment on these points and interpret and discuss the meaning of the odds ratio. If materialism is removed from your study, the manuscript would need to be re-positioned somewhat from making a unique contribution re. materialism. The findings lend support to other research that studied ethnic minorities and their responses to DTC in the U.S. (c.f. Lee, Doohee and Charles E. Begley, "Racial and ethnic disparities in response to direct-to-consumer advertising," American Journal of Health-System Pharmacy July 2010, 67 (14) 1185-1190; DOI: https://doi.org/10.2146/ajhp090600; Byoungkwan, L., Salmon, C. T., & Hye-Jin, P. (2007). The effects of information sources on consumer reactions to direct-to-consumer (dtc) prescription drug advertising. Journal Of Advertising, 36(1), 107-119.) and extend the generalization of the disparate effects of DTC advertising on vulnerable populations to countries outside of North America.

Response to comment: We have reduced our focus on materialism. Firstly, we removed the sentence that the reviewer pointed out was problematic (Page 6). We have also removed the sentence “This is the first study to explore the relationship between materialism and self-reported behavioural responses to drug advertising” from our article summary. Moreover, we clarified our argument development regarding materialism to show that materialistic individuals are vulnerable in the context of advertising rather than being vulnerable per se (Pages 6 and 7). We agree that the findings lend support to other research that has studied ethnic minorities and their responses to DTCA in the United States. We have included the fact that the findings extend the generalization of the disparate effects of DTCA on vulnerable populations to countries outside of North America in both our article summary and discussion (page 19)

Interpreting Odds Ratios

The reporting of your findings has been improved in the revised manuscript; however, you still did not include an interpretation of the odds ratios for the different significant predictors. Given the fact that you have a mix of continuous and categorical predictors, this is important to include as it will help readers assess the strength and significance of your findings. For example, the odds of Indian ethnic consumers asking a doctor for a prescription after having seen a drug ad were 5 times greater than NZ Europeans, while the odds of Chinese ethnic consumers asking were 2.33 times greater. The increased odds over NZ Europeans is substantial and interesting and should be touched on in your discussion. This doesn’t have to be a lengthy addition, but you should at least briefly discuss the magnitude of the findings. On the other hand, the odds ratio for age as a predictor of asking a

pharmacist for more information was 1.01. For every 1-year increase in age, the odds of a consumer asking a pharmacist for more information on a drug after seeing a drug ad increases by 1.01 times.

Response to comment: We have changed the presentation of our results accordingly, to more strongly emphasise which predictors had the strongest effects (pages 15-17). We have also stated in our abstract and discussion (page 19) that some ethnic minorities were strongly more likely to report behavioural responses, relative to New Zealand Europeans.

VERSION 3 – REVIEW

REVIEWER	Marjorie Delbaere Associate Professor Edwards School of Business University of Saskatchewan Canada
REVIEW RETURNED	21-Oct-2017

GENERAL COMMENTS	The authors have addressed all of my concerns and I am happy to accept this revision.